Remarks

The non-final Office Action dated February 3, 2010 lists the following objection and rejections: claims 1-18 and 20 are objected to due to informalities; claims 15-18 stand rejected under 35 U.S. C. § 112(1); claims 5-6 and 10 stand rejected under 35 U.S.C. § 112(2); claims 1, 4-7, 9-10 and 12-19 stand rejected under 35 U.S.C. § 103(a) over the Omura (EP 1168455); claims 2 and 11 stand rejected under 35 U.S.C. § 103(a) over the '455 reference in view of Onda *et al.* ("SIC Integrated MOSFETs" Physica Status Solidi (A), Applied Research, Berlin, DE, vol.162, no. 1, 16 July 1997, pages 369-388); claims 3 and 20 stand rejected under 35 U.S.C. § 103(a) over the '455 reference in view of Miyano *et al.*(JP 403211885); and claim 8 stands rejected under 35 U.S.C. § 103(a) over the '455 reference in view of Hshieh *et al.* (U.S. Patent Pub. 2001/0003367). Applicant traverses the objections and rejections, and does not acquiesce to any rejection or averment in this Office Action unless Applicant expressly indicates otherwise. Applicant's previous arguments are incorporated herein by reference.

Applicant has made amendments to claims 1, 3, 8, 9, 15-16 and 20 consistent with the Office Actions recommendations. With respect to the objection to "the sidewalls" in claim 3, Applicant has not amended claim 3 because claim 1 recites "sidewalls." Therefore, "the sidewalls" of claim 3 have proper antecedent basis. Accordingly, Applicant requests the objections to claims 1-18 and 20 be removed.

Applicant traverses the § 112(1) written description rejection of claims 15-18. The Office Action acknowledges that Applicant's specification includes support for a gradient with a concentration gradient of at least 50. According to *Ariad Pharmaceuticals v. Eli Lilly*, "requiring a written description of the invention plays a vital role in curtailing claims that do not require undue experimentation to make and use, and thus satisfy enablement, but that have not been invented, and thus cannot be described." ___F.3d____, page 26 of majority opinion, decided March 22, 2010 *en banc* (Fed. Cir. 2010). In the instant application, it is clear from the specification that the inventors were in possession of that which was claimed, including the limitation regarding the doping concentration increasing by at least an order of magnitude. The specific examples (cited by the Office Action) of 50, 10, and 200 times are example embodiments. The specification also discusses the use of gradients in more general terms. *See,e.g.*,

paragraphs 0008-0010 of Applicant's published application. Under M.P.E.P. § 2164.02, it is not necessary to disclose all actual embodiments in the specification. Notwithstanding, Applicant has amended claim 15 to recite 50 times. Applicant requests the §112(1) rejection be withdrawn.

Applicant respectfully traverses the § 103(a) rejections because the cited combination of references lacks correspondence to the claimed invention. For example, none of the asserted references teach the claimed invention "as a whole" (§ 103(a)) including aspects regarding, *e.g.,* the thickness of the gate-field plate insulator being greater than or equal to the thickness of the field plate insulator. Because none of the cited references teaches these aspects, no reasonable combination of these references can provide correspondence to the claimed invention. As such, the § 103(a) rejections fail.

More specifically, the '455 reference fails to correspond to aspects of the claimed invention directed to the thickness of the gate-field plate insulator being greater than or equal to the thickness of the field plate insulator. In contrast, the '455 reference teaches that the insulator between buried electrode 17 and gate electrode 19 (second insulating film 18) has a thickness between 400 to 450Å, whereas the insulator (first insulating film 16) for buried electrode 17 has a thickness of 3000Å. *See, e.g.,* Figures 7-14A and Paragraphs 0037-0041. Thus, the insulator between buried electrode 17 and gate electrode 19 is substantially thinner than the insulator for buried electrode 17.

The cited '455 reference teaches away from the asserted modification by leading in a direction divergent from the path that was taken by Applicant. *In re Haruna*, 249 F.3d 1327, 1335 (Fed. Cir. 2001). The '455 reference teaches that the first insulating film 16 (*i.e.,* the asserted field plate insulator) is preferably thicker than the second insulating film 18 (*i.e.,* the asserted gate-field plate insulator), while the thickness of film 16 may be determined by a breakdown voltage and the thickness of film 18 may be determined by a threshold voltage. *See, e.g.,* paragraph 0031. The specific example thicknesses given by the '455 reference indicate that film 16 should be substantially thicker than film 18 (*e.g.,* 3000Å versus 450Å). By expressly teaching that film 16 should be thicker than film 18 the '455 reference teaches a relationship directly opposite, and therefore divergent, from the thickness of the gate-field plate insulator being greater than or equal to the thickness of the field plate insulator, as in the claimed invention.

In responding to the Applicant's previous arguments regarding lack of correspondence, the Office Action improperly ignores the evidence of teaching away with respect to the thickness of the insulating films 16 and 18 presented by Applicant. According to M.P.E.P. § 2145, "consideration of rebuttal evidence and arguments requires Office personnel to weigh the proffered evidence and arguments. Office personnel should avoid giving evidence no weight, except in rare circumstances." Further, "the nature of the teaching is highly relevant and must be weighted in substance." M.P.E.P. § 2145. The Office Action fails to give weight to the evidence that the '455 reference teaches away through specifically disclosing the relationship between the asserted gate field plate insulator and the asserted field plate insulator being opposite of what is claimed. Instead, the Office Action at page 18 dismisses this evidence by simply stating that the "'455 reference does not forbid using a device with the field plate insulator 16 thinner than the gate-field plate insulator 18." The Office Action has failed to give weight to the '455 reference's teaching of the opposite relationship between the asserted gate field plate insulator and the asserted field plate insulator. Accordingly, the Office Action's response to previous arguments is improper, and the §103(a) rejections should be withdrawn.

Further, the Office Action fails to provide proper motivation for the asserted modification. Under M.P.E.P. § 2143.01, "obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so." The Office Action's asserted motivation to modify the teachings of the '455 reference is to achieve desired device performance. The thickness of gate field plate insulator 18 and field plate insulator 16 are disclosed to provide desired device performance with respect to threshold voltage and breakdown voltage. *See* paragraph 0031 of the '455 reference. There is no teaching or suggestion in the '455 reference that changing the thickness in the manner asserted by the Office Action would result in the performance desired in the device of the '455 reference. Rather, the '455 reference teaches that the thicknesses disclosed achieve the desired device performance with respect to breakdown voltage and threshold voltage. *See, e.g.*, paragraphs 0031 and 0100. Accordingly, the Office Action has failed to provide proper motivation for the modification to the '455 reference.

The Office Action's asserted motivation and arguments indicate that the Examiner is engaging in impermissible hindsight reasoning. Under M.P.E.P. § 2142, "impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art." The '455 reference teaches that the desired performance of the reference's device is achieved by the asserted field plate insulator (first insulating film 16) being thicker than the asserted gate-field plate insulator (second insulating film 18). *See* paragraph 0031 of the '455 reference. The only evidence of Examiner's desired device performance which leads to the claimed invention is found in Applicant's specification and claims. Accordingly, the Office Action has engaged in impermissible hindsight reasoning, and the §103 rejections are improper and should be withdrawn.

Applicant further traverses the rejections because the cited portions of the '455 reference do not correspond to aspects of the claimed invention directed to the drift region having a steeply graded doping concentration, with the concentration increasing from the body region to the drain region (*e.g.,* the concentration is at least 50 times greater adjacent to the drain region than adjacent to the body region). Applicant's disclosure teaches benefits associated with having a steeply graded concentration gradient. *See, e.g.,* Paragraphs 0021-0022. However, the cited portions of the '455 reference provide no appreciation of or recognition for such benefits, and thus any proposed modification would appear to be improperly based upon Applicant's disclosure. *See, e.g.,* M.P.E.P. § 2142. More specifically, the cited portions of the '455 reference simply teach that the impurity concentration of drift layer 12 increases toward the substrate 11. *See, e.g.,* Figure 2 and Paragraph 0053. The cited portions of the '455 reference do not provide any indication regarding the actual level of impurity concentration in drift layer 12 near well layer 13 relative to the actual level of impurity concentration in drift layer 12 near substrate 11, let alone teach that the doping concentration in the drift region has a steeply graded concentration gradient as in the claimed invention. Accordingly, the rejections are improper and Applicant requests that they be withdrawn.

In responding to Applicant's previous arguments, the Office Action improperly asserts that the limitation regarding concentration does not have patentable weight. Under

M.P.E.P. § 2143.03, "all words in a claim must be considered in judging the patentability of that claim against the prior art." It appears that the Office Action is attempting to ignore the limitation under M.P.E.P. § 2144.05 regarding optimization of ranges. *See* M.P.E.P. § 2144.05 ("Generally, difference in concentration . . .will not support the patentability of subject matter . . . unless there is evidence indicating such concentration . .. is critical.") Assuming, *in arguendo*, the Office Action had presented a *prima facie* case of obviousness based on overlapping ranges, Applicant can rebut the obviousness "by showing the criticality of the claimed range." Applicant's specification teaches that "[b]y providing a steeply graded concentration gradient in the drift region it is possible to achieve structures having both a low specific on-resistance and a low switching loss." Paragraph 0020 of the published application. Accordingly, Applicant's specification teaches that the gradient is critical. Therefore, the claimed concentration gradient is not obvious based on the '455 reference, and the § 103 rejections should be withdrawn.

Applicant has added new claim 21. Support for the claim can be found, for example in paragraphs 0019-0021 of the published application. Applicant notes that the Examiner has previously objected to the claim language "steeply," which is used in new claim 21, as a relative term. The scope of the term "steeply" would be clear to the skilled artisan when read in light of Applicant's specification (*see, e.g.,* M.P.E.P. § 2173.05(b)), in contrast to the Office Action's erroneous assertions. For example, paragraphs 0019-0021 of the published version of Applicant's specification discuss the drift region having a steeply graded doping concentration that increases from the body region to the drain region, including giving specific examples of the increases in concentration that include the doping concentration being 50, 100 or 200 times greater adjacent the drain region (as recited in claims 16 and 17). Further, claim 21 includes language, including the ratio of the doping concentrations, which makes clear the meaning of "steeply," pursuant to M.P.E.P. § 2173.05(b). Applicant believes the previously applied objection should be overcome.

In view of the remarks above, Applicant believes that each of the rejections has been overcome and the application is in condition for allowance. Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is asked to contact the agent overseeing the application file, Peter Zawilski, of NXP Corporation at (408) 474-9063 (or the undersigned).

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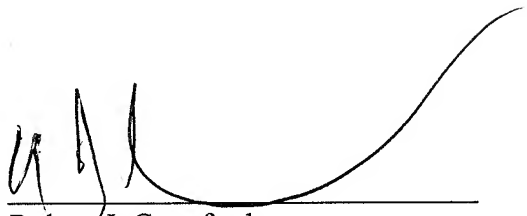
By: 

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